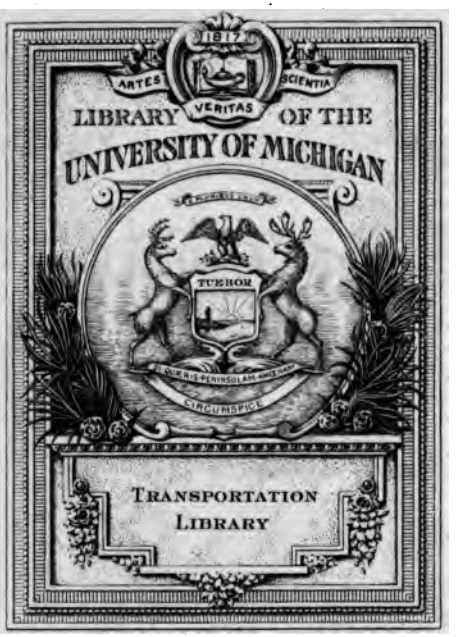
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RAILWAY RESCUE:

A LETTER

ADDRESSED TO THE DIRECTORATES

OF

GREAT BRITAIN.

BY

A TRAVELLER OF MANY LANDS.

"Set your shoulders to the WEAL."

LONDON:
EFFINGHAM WILSON, ROYAL EXCHANGE.

1848.

RAILWAY RESCUE.

GENTLEMEN,

IT is the fashion for those who imagine they have something to say on railway subjects, to address themselves to the shareholders, I prefer to speak to you, having come to the conclusion that shareholders are practically an arithmetical *nil*—a fluctuating body of sheep-men, here to day and gone to-morrow; now jumping through a hedge-gap into a rich pasture, and anon floundering in an impracticable marsh, without the wit to understand that the pasture of this quarter may be the marsh of next quarter, and *vice versa*. In short, they merely play the game of "follow my leader" at the sport of chance. They are a passive and not an active body, buying when shares are up in the market, and selling when they are down. They are in short that nobody, the public, whom all active men, with intellectual faculties alert, and moral faculties dormant, consider to be "their oyster," which they, not "with sword," as in the olden time—but with cunning, after modern fashion, "will open."

You, gentlemen, for the most part are not sheep. You know what you want and seek it, after the most approved methods the law has left at your disposal. You want railways to prosper, but the law says they shall not prosper by direct courses, and, therefore, are

you as ill-used a body of men as any in the British Empire. And thus are railways made at double their proper cost, and from your inability to pay large dividends on wasted capital, your shareholders, who are "unlucky in their speculations," conceive themselves privileged to abuse you, and none more so than those comparatively few, not sheep-men, but wolf-men, who have bought at half-price the property of the original railway makers. and with a good dividend on their real capital, represent themselves as injured innocents on their nominal holdings.

In a commercial country the value of all property can only be measured by the usufruct—in other words, by the interest it will bring. First cost has nothing to do with it. If a property will produce a large interest with probable permanence, it will sell at a corresponding value. If it be risky, only sheep-men buy it, at a large price. Say that a railway has been made at a cost of one hundred pounds per share, and that every share produces ten pounds per annum, the shares rise to two hundred and fifty pounds value, because sheep-men fancy that the annual ten pounds are as certain as government stocks. Circumstances arise, which clear-headed men could have predicted from the outset, and the annual ten pounds dwindle to seven, whereupon the sheep-men take the alarm, and the two hundred and fifty estimated value drops down to one hundred. At this price wise men begin to buy, as a better speculation than ever, and the sheep-men sell till the market again rises to an equivalent, for a supposed permanent annual seven pounds, when they again buy. Parellel are they to the sheep in Cowper's fable, who would "leap into the grave to save their lives."

The *rationale* of buying railway shares is this: They are bought either on speculation or for investment. If in the former case, the approved mode is simply to wait till they are reduced by panic, then buy, and retain them till the panic wears out. By methods as simple as this, have the majority of large railway fortunes been made. Any man who had given moderate attention to the comparison between horse transit and steam locomotion at the outset of railways, might calculate with certainty on an irrational over-appreciation of the stock, as well as a corresponding under-appreciation, when competition produced the first depression. It has been often said, that any merchant with a fortnight's information in advance of his fellows, would be enabled to monopolise the whole profits of commerce. Men of prescience in mechanical or chemical knowledge are precisely in this position.

But if railway shares are bought for investment in the present day, a large quantity of knowledge is essential, as well as clear judgment. A rational man would proceed thus: he would throw aside altogether market quotations of value, and go through the items of the original capital account, to separate the wasted from the available capital. He would arrange in one column,—

Law and parliamentary expenses,
Exorbitant engineering,
Exorbitant price of land.

These and sundry other things he would strike off from the capital, and then reduce to an average market value the price of the rails and machinery, bridges, erections, earthwork, &c. The total of this would be the price for which a parallel railway would be made under the most favourable circumstances, and for which

railways will be made in future times. But there is yet more; he would consider also the value of the moving machinery, and the probability of its not being superseded by an improved kind during the period of its mechanical durability. Beyond this he would consider the condition of the rails, and the destructive process, more or less rapid, induced by the weight of the transit over them: again then would be the quality and durability of the sleepers. For all these things he would make a due deduction, and the residue he would estimate as the mechanical value of the railway. He would then consider the question commercially, as to whether the traffic were of a permanent kind, and not likely to be superseded, and also if sufficient in amount to pay interest and produce a dividend. Having settled this, he would look to the management. If managed in the best possible way he would strike off something for the chance of contingencies; if badly managed, he would regard it as a favourable circumstance for future advantage, increasing its market value. Having weighed all these things, the *bona fide* inventor would have true data whereon to determine his purchase. Such an investment would be as safe as any government funds, and the inventor might wholly disregard all consideration of fluctuations in the market. Purchasing railway shares to produce four per cent. per annum, at a price based on such an exact valuation, would be better than any government funds, because the mere increase of population must make it an improving property from year to year.

Such directors as rule over badly managed railways ay have better hopes in bad times than those who ve done their utmost in good management.

Railway property is at present depreciated from three causes:—First, the general depression of all trade. Secondly, the competition which is springing up between approximating railways. And, thirdly, the large amount of branch lines, made far too expensively, and, worse than all, at the cost of ruinous contests. "Suckers, and not feeders, I call them," said a railway shareholder; but this is not quite a true statement. Many are not yet finished, and but few are in full work. They will all ultimately pay, notwithstanding the wasted outlay, because the profits are a growing quantity. But, as a financial calculation, there never was any course more absurd than the senseless oppositions made by almost all the main lines. It originated in the idea that it was possible to monopolise railway transit as had been done by canal transit, forgetting the obvious distinction that canal water is a limited quantity, while railway land is all but unlimited. There is, it is true, a species of railway monopoly quite practicable to establish, and of which I will presently speak, but that is a monopoly peculiar to each railway and not to be abstracted from one by another.

Railway directors are at the present time generally in a state of discomfort at their reduced dividends. To remedy this, they propose to make the public more uncomfortable, first, by increasing the fares, and, secondly, by diminishing the number of trains. It requires no great amount of foresight to predict that one result of this will be the increase of horse transit, for it is an assured truth that people will travel as much as possible at their own convenience, and also as cheaply as they can. It is a question for consideration whether it is wise to tempt people to try new modes before

every means have been resorted to, to diminish the expense of the old. Light trains and frequent are the true policy, and it is worth the inquiry how far friction and gravity may be reduced by new or careful construction. Otherwise new lines may be enabled to beat the old ones out of the market. It is a perilous experiment to practice on public patience.

But little skill is required to see that the rolling-stock and the rails are mismatched to one another. Any man, woman, or child, passing through a turnpike on a highway, may observe a table of tolls regulated, or supposed to be regulated, with a progressive advance proportioned to the destructive powers of the vehicles travelling on the road. It is true that they are not graduated by any true perception of mechanical science or skill, but still they have a perception of the truth that vehicles vary in their destructive powers, from the light-sprung poney-gig up to the ponderous unsprung coal-wagon. But railway directors seem wholly uncognisant of this important truth. Not so, some of the contractors, for "maintenance of way," who in their early contracts stipulated for the weight of the engines intended to run over the rails; and it is said that such prescient men have tabooed the passage of the locomotive rail-rolling mills of the present day, unless for an extra-consideration.

If there be any doubt expressed as to the discrepancy of strength between the rolling-stock and the rails, a very plain answer may be found in the fact of the general renewal of rails now required. If this be not enough, let the proportions of the periphery of a locomotive driving wheel be compared with the rail beneath it. The former weighs upwards of 200lbs. per yard; the latter from 70lbs. to 80lbs. Yet the

former is of an arch-form, supported by the spokes at intervals of nine inches, while the latter is a simple straight beam, supported at intervals of three feet, with joints at intervals of fifteen feet, which invariably deflect beneath the passing load and destroy the continuity of support. To make a perfect railway, the rail bar should be of sufficient vertical depth to resist all deflection, with the heaviest load pressing over it. More than this, it should be sufficiently hard to prevent lamination. And the joints of the rails should be so re-enforced as to be equally inflexible with the solid part of the rail. None of these conditions are yet attained as regards the modern class of engines, and it is a problem whether they can be attained at all. Even as there is a limit to the height of architectural structures relatively to their base, by reason of the friability of the material, so there is a limit to the weight of engines, by reason of the compressibility of iron and the impossibility of increasing surface-bearing; for whether a driving wheel be of three feet or eight feet in diameter, the contact with the rail can only be a point, or that which geometers call a "flowing point," viz., a line. Iron, according to its density, will bear a given weight without compressing, the point of contact being a line. When iron has done its utmost, steel may be resorted to; and, possibly, a rail of 200lbs. per yard, of deep vertical section, with a surface of hard steel three inches in width and three quarters of an inch in depth, supported by cross sleepers at intervals of eighteen inches, might be available to construct a real "permanent way,"—for the modern engines. "Permanent way" is at present a *lucus a non lucendo.* "Permanent *maintenance* of way" is a practical fact, as shareholders pockets can testify.

You, gentlemen, will doubtless be startled at the contemplation of the outlay of capital involved in the real permanent way before described. If you will not agree to this proposition, you must "try back." If you cannot suit the road to the wheel, you must suit the wheel to the road. Having the fear of "no dividends" before your eyes, you must turn to the practical maxim of the Manchester and Liverpool directors of old, gathered from the experience of the road, and keep down your weights. Light horses for the high speeds. Brewers' horses for the drays. Small trains and frequent, with small station-room, few police and porters, and fewer clerks, a slight increase of drivers and stokers, and a huge decrease of platelayers and a reduction in iron invoices, would do more for your dividends and the public accommodation than the present system of elephantine traction, with a yielding foothold—a power developed and wasted. For it must be obvious that if, after expending millions to secure "good gradients," a deflecting rail be laid down, it is equivalent to converting them into bad gradients. In water-transit a steam-boat drives a greater or lesser wave of water before her bows. In rail-transit a locomotive drives a WAVE OF RAIL before her driving wheels equivalent to ascending a constant incline, and demanding a far greater expenditure of steam power to surmount it. The difference in the two cases is, that it is impossible wholly to surmount, though we modify the difficulty, with the steam-boat, whereas in the case of the rail it is practicable to surmount the difficulty altogether by proportioning the load on the wheel to the strength of the rail.

THE WAVE LINE OF THE RAILS might fairly be adopted as a standard in estimating the value of a rail-

way, for in proportion to the depth of the wave, will be, *cæteris paribus*, the power of steam and the cost of coke. You must be aware that, to ascend a constant hill, requires more horse-power than to travel along a level. Your horse-power is steam, and the railway oat is coke. If your drivers and ostlers and road-trustees increase the consumption of oats, the coach will soon be run off the road.

But even wave lines vary. For example, rails laid on longitudinal timbers, as the Great Western, yield an equable wave line. Rails laid on chains and transverse sleepers make unequal waves at their mid-length and at their joints. The result is concussion as well as sinking, and the loss of power is greater. Mechanical men having their living to get by the prevention of waste, and the economy of steam-power, readily apprehend all this, for they carry the safety-valve in their own breeches' pockets, but it does not so readily occur to railway directors. Let them then maintain a standard gauge—THE WAVE LINE OF THE RAILS. Perhaps as an additional stimulant you will take into your thoughts the somewhat startling fact that a pair of the largest railway locomotives would furnish power enough to supply the largest pumping water-works in London. Another pair might achieve the task of delivering the water into their attics instead of the ground floors of the London dwellings. Another pair might pump up all the sewage water south of the Thames, as Mr. Chadwick will inform you.

A given amount of steam-power developed should perform a certain amount of work, *i. e.*, lift or draw a given load, after making allowance for friction. This friction should be a known quantity: Nicholas Wood will tell you that on the axles of a grindstone it is pre-

cisely four pounds per ton. Now, if you, gentlemen, were to cause dynamometers to be attached to your locomotives whereby to draw the trains, you would gain the knowledge how much surplus steam-power you are expending, precisely as the old coachmen understood by the sweating of their horses, whether the coach was *alive* or a *drag*. There is a generally received opinion amongst railway authorities, that wagon traction on good rails in a still atmosphere is eight pounds per ton. If this be so, we have here four pounds per ton added to Nicholas Wood's four pounds of axle friction, which must arise from some quarrel between the peripheries of the wheels and the rails, and consequently is capable, under favourable circumstances, of being reduced to *nil*. Now, it is possible that, by the application of dynamometers, you might discover the friction in some cases to be twenty-five pounds or more, in which case you would be tripling your consumption of steam—a patient drudge, who, unlike the horse, does not break his wind at road-work, or quite drop down in harness. If comparisons be thus instituted between the power developed and the work done, it will not be difficult to hunt the sources of resistance into a corner, whether arising from defective rails, undue gravity, or undue friction between the wheels and the rails, which ought not to be friction, but simply a rolling change of surfaces.

Whether all these things are to be done by yourselves, or whether all the working of railways is to fall into the hands of individual contractors, feelingly alive to pecuniary savings as the condition of their existence, precisely as was the case under the old system of transit by horses, is a problem yet to be mooted. But it is quite clear that the sheep-men amongst shareholders,

who object to using steamboats or omnibuses as part of the links of transit, are of the class who ought not to work railways, but simply to own tolls, like the canal owners of former times. In such case they must be content with a mere investment interest, a little above the public funds. But if railway directors are to work railways as a source of extra-profit, they must engage in many things indirectly promoting traffic.

In truth, railways are not developed. They are too much regarded as an exclusive mode of transit. They are supposed to be the enemies of canals and highways, and the respective proprietors are all mutually embued with the spirit of trade rivalry. They are, after all, but an improved highway for quicker transit, and the nearer they are to canals and highways, the more they will thrive. But they have been regarded only as media of communication between distant towns, and in many cases they run through long districts unintersected by roads, or at any rate unapproachable. No road can possibly pay well relying on such traffic, unless it possess an artificial monopoly similar to that the London and Birmingham formerly possessed, being the only quick channel of communication from north to south. But the railways being made, the next question is how to develope traffic along their borders. Branch lines have been resorted to, but made so expensively, that the remedy is worse than the disease. It is not an essential part of all railways to work them by steam. Steam, to be economical, requires constant and abundant work. But it does not follow that railways will not pay without constant work, provided they be made at low cost. And the feeders to railways may in many cases be advantageously made for horse traction, in which case a narrower gauge

than the 4ft. 8in. can be used, for it is not essential that the one should run into the other.

Steam railways can only be thoroughly developed by the aid of horse-railways or highways bordering them throughout their lengths. In default of these, existing lines and highways might be converted to these purposes by a 3ft. gauge of light rails inserted in their surfaces. One horse would thus do the work of ten, and carriages and wagons of exceeding light construction might be used. Upon such roads, farms and residences would increase, on account of their cheapness of communication, and such light wagons might be hoisted on to the railway trucks at stations without the trouble of unloading. As the traffic increased, and these roads grew in importance, the regular gauge might be laid down, and steam might replace horses advantageously, the traffic being created for it beforehand.

All this, however, will be but a slow process, owing to a defect in railway legislation, and the main lines will long continue mere means of communication between distant towns, until the railway proprietary shall join manfully together to enforce the legislature to remedy the evil. Railway companies are permitted by law to take forcible possession of individual property to make a road, and to work it, under certain tolls, limited by law to a very high rate, capable of decrease at will, but not of increase. The result is, that railway owners and bordering proprietors are at constant war, the one striving to raise fares and the other to lower them. Railway proprietors are regarded as so many Esaus. Their hands are against all their neighbours' and their neighbours' against them. The legislature has prohibited them from gaining money by any

means but fares, while those who use these lines may carry on any trade they please. The result is most mischievous. Witness the Croydon line, where low fares induced builders to speculate, and where subsequent disputes with the government proprietors caused the fares to be augmented, to the serious annoyance of those who had leased-dwellings. Witness the Dover line, where a large rise in fares defeated the calculations of large numbers, who had taken houses down the lines. Witness the alterations of trains and rising of fares now going on, whereby numerous men in business are defeated of their object in taking country houses, and which uncertainty will gradually drive all such persons away to the old lines of coach road, where they can ensure regularity by competition. A strong reaction must be the infallible result of the present movement.

So long as the present law exists, this state of things will continue—the law which prohibits railway owners from holding property to benefit the railway indirectly. A private company may purchase land and make a road through it, and build houses on each side the road. Why should a railway company be debarred from acquiring land by purchase on their borders and building houses and streets thereon. The value of a street is estimated by the value of the buildings and property on each side,—and the value of the railway would be increased in the same way, when once the railway proprietors were permitted to become owners of buildings. The railway itself would be a secondary consideration, and cheap fares and numerous trains would be an infallible result. Railway companies would soon lay out farms and build factories, and let out power and supply water and gas and manure, and

open mines and quarries, and teach landed proprietors to go and do likewise, when once this stumbling-block were removed. They contain dormant, the elements of prosperity, far greater than their most sanguine projectors ever dreamed of in their calculation of tolls and fares.

Band yourselves together for this purpose, gentlemen, and give the key-note to the sheep-men amongst your proprietary to "hold on like grim death" to their shares. Let none sell but the absolutely needy, and all others bide the good time that must infallibly come. Besiege the legislature early and late, in good time and in bad time, in season and out of season, to grant ye this boon of justice; and if the cuckoo-note of "monopoly" be raised against ye by opponents, laugh them to scorn in answer, and bid them make a parallel line to compete with you, and break down the monopoly. Marvellous will be the prosperity of this brave England when the mutual interests of her Captains of Industry shall work with instead of against each other. Why should railway owners be the chafferers of transit to "suburban village" makers—why should they not make their own suburban villages, and collect rents with moderate tolls? Why should not the proprietors of coast lines build bathing villages and run branch lines to them? Why should not railway owners in Ireland drain bogs, and work mines, and rent them out when reclaimed?

It can only be by this process that agriculture can be improved and rise to the level of the mechanical arts, that coal can be made a cheap article on farms, and steam labour be introduced. The lead once given in this direction, it will not be long ere portable railways will be devised for farm use, capable of being shifted